CO2 adsorbers for upgrading of bio-gas to methan

Schill, Leonhard; Riisager, Anders; Fehrmann, Rasmus

Published in:
Book of Abstracts. DTU's Sustain Conference 2015

Publication date:
2015

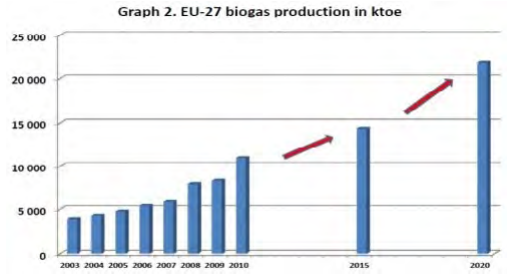
Document Version
Publisher's PDF, also known as Version of record

CO_2 adsorbers for upgrading of bio-gas to methan.

Leonhard Schill[1], Anders Riisager[1], Rasmus Fehrmann*[1]

[1]Centre for Catalysis and Sustainable Chemistry, Department of Chemistry, Building 207, Technical University of Denmark, DK-2800 Kgs. Lyngby, Denmark

*Corresponding author email: rf@kemi.dtu.dk



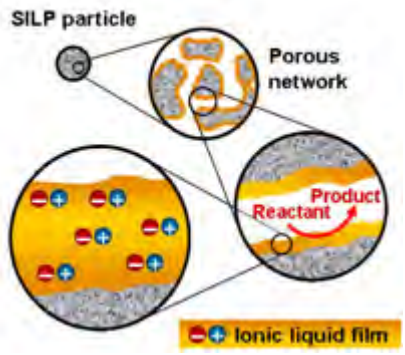


Figure 1: Growht of the EU biogas market.[1] Figure 2: Concept of Supported Ionic liquids (SILP)

The bio-gas market in the EU has experienced strong growth over the last 10 years and is expected to expand even further in the near future, see Figure 1. While the anaerobic digestion is a relatively mature technology, the upgrading of bio-gas (i.e. removal of CO_2 to yield pure methane) still needs to be optimized. Currently, the most widespread technology for CO_2 removal is treatment with aqueous amine solutions. However, implementing this technology at small biogas plants can be problematic, because it is not modular.

Using Ionic liquids which can reversibly bind CO_2 is an alternative way to upgrade bio-gas. However, these liquids are very viscous which makes the gas-uptake extremely slow. By forming a thin film of ionic liquids onto inorganic support materials like alumina and silica can remove the problem of slow gas-uptake. The resulting materials are also called “Supported Ionic Liquds” (SILP).

In order to integrate the SILP materials into gas filters, it is necessary to shape them into monolithic form. Our group has made some progress in this field.

References:

[1]: *The GreenGasGrids Project: Boosting the European biomethane market*